



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,324	11/08/2001	Chidane Ouchi	684.3278	5125

5514 7590 07/01/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

KIM, PETER B

ART UNIT PAPER NUMBER

2851

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,324

Applicant(s)

OUCHI, CHIDANE

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12002.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirose (4,811,055).

Hirose discloses a projection exposure apparatus comprising a continuous emission excimer laser (200), an illumination optical system (3), a projection optical system made of single glass material (5, col. 2, lines 35-55), and a laser (100) for injecting light of the predetermined wavelength into a resonator of the excimer laser (col. 2, lines 61 – col. 3, lines 22). Hirose also discloses illuminating reticle with slit-like light and scanning means for scanningly moving the reticle and the substrate to expose the substrate (col. 2, lines 30-60). Hirose also discloses the shifting the mirror (103) to control the wavelength.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose (4,811,055) in view of Tezuka et al. (Tezuka) (5,170,207).

Hirose discloses the claimed invention as discussed above; however, Hirose does not disclose half bandwidth of wavelength spectrum indicated in the claims or the projection optical system made from the material indicated in the claims. Tezuka teaches that ArF laser are a well known (col. 7, line 67 – col. 8, line 2), and using ArF inherently include lasers wherein a half bandwidth of a wavelength spectrum of the laser light is not greater than .1 pm and would allow an image of a linewidth of .13 microns. Tezuka also teaches F2 lasers are well known in the art (col. 7, line 67 – col. 8, line 2), KrF laser inherently include laser wherein a half bandwidth of a wavelength spectrum of the laser light is not greater than .08 pm and would allow an image of a linewidth of .09 microns. Tezuka shows in Fig. 3, a projection optical system that includes a lens system made up of plurality of lens designed to optimize exposure during lithographic process made with short wavelength lasers (abstract). Further it is disclosed that the lenses of the system of Tezuka should be made with SiO₂ or CaF₂ (col. 1, lines 40-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include the projection optical system of Tezuka in the apparatus of Hirose in place of the projection lens and

to provide ArF and KrF lasers, in order to optimize the exposures performed with short wavelength lasers and to use different lasers recognized in the art as alternatives.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirose (4,811,055) in view of Hirose (4,891,663).

Hirose discloses the claimed invention as discussed above; however, Hirose (4,811,055) does not disclose the projection optical system made from the material indicated in the claims. Hirose (4,891,663) shows in Fig. 2, a projection optical system that includes a lens system made up of plurality of lens designed to optimize exposure during lithographic process made with short wavelength lasers (abstract). Further it discloses that the lenses of the system of Hirose should be made with SiO₂ or CaF₂ (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include the projection optical system of Hirose in the apparatus of Hirose in place of the projection lens, in order to optimize the exposures performed with short wavelength lasers (col. 1, lines 48-55).

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable Hikima (4,952,945) in view of Eden et al. (Eden) (4,736,381).

Hikima discloses a projection exposure apparatus with a continuous emission excimer laser (100), an illumination optical system (302), and a projection optical system (304) made of single glass material (col. 1, lines 33-35). Hikima also discloses illuminating reticle with slit-like light and scanning means for scanningly moving the reticle and the substrate to expose the substrate (col. 4, lines 60-61). Hikima also discloses a wavelength detecting means (200) for detecting the wavelength of the laser light from the excimer laser light and a resonator length changing means (21) where a shifting means shifts mirror in resonator (col. 4, lines 24-26).

However, Hikima does not disclose a laser for injecting light of a predetermined wavelength into the resonator of the excimer laser. Eden discloses a laser (4) for injecting light of a predetermined wavelength into a resonator of the continuous emission excimer laser (1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the optically pumped laser of Eden to the invention of Hikima in order to obtain continuous emission with high energy efficiencies as taught by Eden in col. 2, lines 5-15.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703 308 2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 306 3431.



Peter B. Kim
Patent Examiner
June 26, 2003